NEW SPECIES OF *ANTIPATHES* AND *PARANTIPATHES* (CNIDARIA: ANTHOZOA: ANTIPATHARIA) FROM COASTAL WATERS OF SOUTH AUSTRALIA AND TASMANIA

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One new species of the genus *Antipathes* and two new species of the genus *Parantipathes* are described from the coastal waters of South Australia. *Antipathes antrocrada* sp. nov. resembles *A. bifaria* Brook, 1889 and *A. lata* Silberfeld, 1920, but differs from these two species in having less crowded polyps, larger pinnular spines, and thinner pinnules that are more spreading and not as strongly directed distally. *Parantipathes helicosticha* sp. nov. differs from the closely related *P. tetrasticha* (Pourtalès, 1868) by having shorter pinnules, larger spines and smaller polyps. *Parantipathes triadocrada* sp. nov. is similar to *P. columnaris* (Duchassaing, 1870), but is branched to a greater degree, does not have a reticulated worm run along the stem or branches, is extensively subpinnulated, and rarely has more than three pinnules or subpinnules in each verticil-like cluster.

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Introduction

This is the second in a series of papers dealing with the antipatharian fauna of the waters off southern Australia and Tasmania. Species of the genus *Leiopathes* have been previously described (Opresko 1999). The holotypes and paratypes of the new species are deposited in the South Australian Museum (SAM), Adelaide, S. Australia. Schizotypes are deposited in the U.S. National Museum of Natural History (USNM) in Washington, DC.

Taxonomic Section

Order Antipatharia Milne Edwards, 1857

Family ANTIPATHIDAE Ehrenberg, 1834

Genus ***Antipathes*** Pallas, 1766

Remarks

In 1834 Ehrenberg used the name Antipathina for a family-level taxon in the Order Scleropoda of the Class Bryozoa. Although it is likely that Ehrenberg was actually referring to a bryozoan that was encrusting an antipatharian axis, his usage has priority over subsequent designations in which the family was more correctly identified as anthozoan corals (see Gray 1840 and Dana 1846). Note: if the taxonomic revision of van Pesch (1914) is followed, over 150 nominal species must be assigned to the genus *Antipathes*. This arrangement totally obscures the natural affinities of the various species complexes in the genus. Because a revision of the order focusing on the identification of these species complexes and the establishment of new genera and/or subgenera is currently being undertaken, diagnoses and keys for the currently recognized genera will not be presented here.

Antipathes antrocrada **sp. nov.**
(Figs 1–3)

Diagnosis

Corallum branched and pinnulated. Primary pinnules on branches and branchlets arranged alternately, generally bilaterally, and inclined distally. Secondary pinnules arranged uniserially near base of primaries, projecting out of plane containing primary pinnules, and inclined distally relative to primary pinnule on which they arise. Distal secondary pinnules bilateral, with narrow interior angle; interior angle generally increasing with increasing size of branchlets. Spines on pinnules simple, conical to subcylindrical with an acute apex; inclined distally; generally 0.10 to 0.14 mm tall on highest order pinnules, increasing to about 0.2 mm on lower order pinnules and

FIGURE 1. *Antipathes antrocrada* sp. nov., holotype, SAM H-746, entire corallum, height about 22 cm.

branches; maximum size about 0.3 mm. Polyps usually 0.8–0.9 mm in transverse diameter; arranged uniserially, with 9–10 polyps per centimetre.

Description of Holotype

The holotype (SAM H-746; Fig. 1) may only be a branch from a larger colony; a basal plate is not present. It is about 25 cm tall and 12 cm wide and the 'stem' or primary branch is 3.0 x 4.5 mm in diameter at its basal end. Several large branches come off the 'stem' in an irregular fashion and at irregular angles, and they bear smaller branches. Both branches and branchlets are curved to varying degrees, and all are pinnulate. The arrangement of the pinnules and subpinnules is

FIGURE 2. *Antipathes antrocrada* sp. nov., holotype, SAM H-746. **A**, outer edge of corallum showing the arrangement of the pinnules, approx. x 1.2. **B**, pinnules with polyps, approx. x 3.0.

not perfectly regular throughout the colony. In general, primary pinnules on the branches and branchlets have the appearance of being arranged alternately in two nearly opposite rows (Fig. 2A). The primary pinnules are mostly 1–2.5 cm long and 0.1–0.15 mm in diameter at their base excluding spines (0.2–0.3 mm wide including spines). They are spaced 3–5 mm apart in each lateral row and within each row they arise anterolaterally such that the interior angle formed by the two rows is 60–90° at the point of insertion on the branch. However, the more distal sections of the primary pinnules are recurved such that two pinnular rows have the general appearance of being nearly opposite one another. The primary pinnules are also inclined distally (distal angle 45–70°). The primary pinnules, in turn, often have a series of 3–6 secondary pinnules (Fig. 2A), mostly 4–5 mm long and 0.14 mm in diameter (up to 10 mm long and 0.16 mm in diameter), and spaced 2–4 mm apart. The lowest secondary pinnule is 4–6 mm from the base or point of insertion of the primary pinnule. The lowermost secondary pinnules on each primary are arranged uniserially, inclined distally, and tend to lie in a plane at nearly right angles to the plane containing the primary pinnules. Pinnules longer than 1.5–2 cm become branchlets with the distal-most secondary pinnules becoming bilateral and alternating, usually with a very narrow interior angle. Thus, over the entire corallum, and even on the larger branches, there is a pattern in which the pinnules go from a uniserial arrangement proximally to a bilateral arrangement distally, and for the interior angle formed by the two lateral rows of pinnules to increase with increasing length and thickness of the branchlets.

The skeletal spines (Figs 3A–3C) are simple, conical to subcylindrical, with a smooth to slightly coarse distal surface and an acute apex. The polypar spines are larger than the abpolypar spines; both tend to be inclined distally. Polypar spines on the lower portions of the higher order pinnules (axial diameter 0.1–0.15 mm) are generally 0.10 to 0.14 mm tall (distance from the midpoint of the base to the apex); the abpolypar spines are 0.08–0.10 mm. On the pinnules the spines are arranged in axial rows, 4–7 of which are visible in lateral view (excluding rows in which spines are only partially visible). The distance between adjacent spines in each row ranges from 0.08–0.18 mm, and there are 6–8 spines per millimetre in each row. The spines increase in number and size and become more acicular with increasing thickness of the axis; on pinnules or branchlets having a diameter of 0.2–

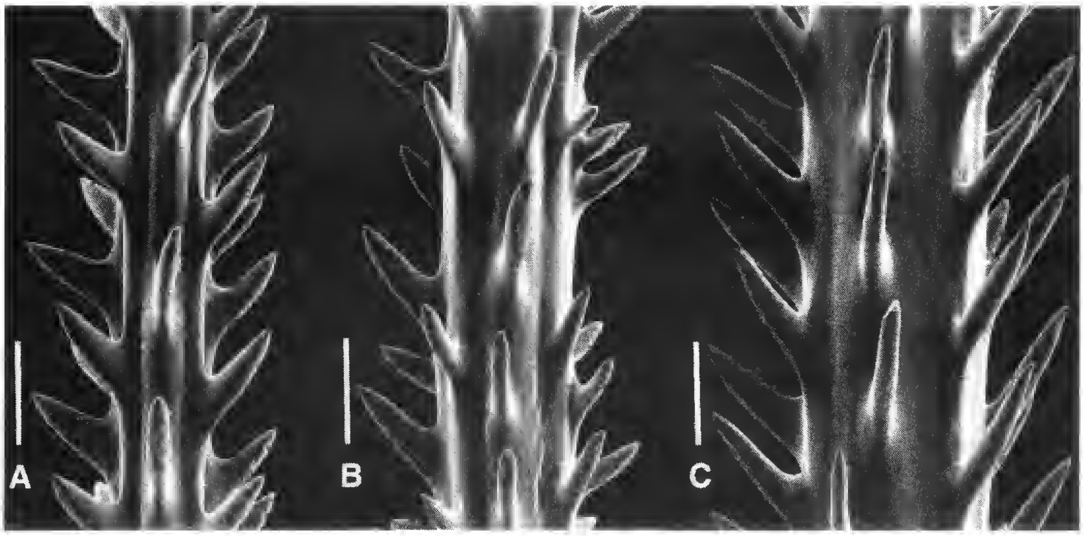

FIGURE 3. *Antipathes antrocrada* sp. nov., scanning electron micrographs of holotype, SAM H-746. **A**, Spines on pinnule 0.09 mm in diameter. **B**, spines on pinnule 0.12 mm in diameter. **C**, spines on branchlet 0.19 mm in diameter. Scale bars 0.1 mm.

0.3 mm the spines are 0.12–0.18 mm tall; on larger branches (0.3–0.4 mm in diameter) they are up to 0.22 mm tall. The spines on the lowest part of the 'stem' (diameter 3.2 mm) are mostly simple, 0.2–0.24 mm tall (maximum about 0.32 mm) and 0.02–0.03 mm in diameter; a few are forked at the apex.

The polyps (Fig. 2B) are distributed uniserially and generally restricted to the pinnulated side of the branches and branchlets. On the primary pinnules the polyps are found on the side having the subpinnules; they are at right angles to the direction of the branch on which the pinnules occur, or they can be offset somewhat towards the upper side of the pinnules relative to the direction of the branch. Where the interior angle of the pinnules is narrow, the polyps in opposing lateral pinnular rows face towards each other. On the secondary pinnules the polyps are positioned laterally (at right angles) relative to the direction of the primary pinnule, or they are offset, to varying degrees, towards the upper side (in the direction of the distal end of the primary pinnule). The polyps range in size from 0.6 mm to 0.9 mm (transverse diameter as measured from the distal side of base of distal lateral tentacles to the proximal side of the base of the proximal lateral tentacles), but most are 0.8–0.9 mm. The interpolypar space ranges from 0.1 to 0.2 mm, the smaller space usually found between two larger polyps. On average, there are 9–11 polyps per centimetre. The mouth is often slit-shaped and elongated along the sagittal axis and surrounded by a wide oral disc, and the tentacles are up to 0.3 mm long (in the alcohol-preserved material). Polyps are restricted to one of the two wider sides of the stem, but they are more scattered and not in a single series.

Discussion

The paratype (SAM H-745) shows the same general growth form as the holotype; however, in this specimen there is more variability in the interior angle formed by the two rows of pinnules, and many pinnules are inclined distally to a greater degree than those in the holotype. Furthermore, the lowermost (most basal) secondary pinnules often occur further away (i.e., up to 10 mm) from the base of the primary pinnule than those in the holotype.

Comparisons

Antipathes antrocrada sp. nov. resembles *A. bifaria* Brook, 1889 and *A. lata* Silberfeld, 1909. In all of these species the corallum is irregularly branched and pinnulate, and the pinnules are arranged uniserially to biserially. However, based on the descriptions given by Brook (1889) and Silberfeld (1909), the pinnules in *A. bifaria* and *A. lata* are more strongly directed distally (distal angle less than 45°), and the interior angle formed by the two pinnular rows is much narrower than the condition occurring in *A. antrocrada*. In addition, the pinnules in these species appear to be thicker than those in *A. antrocrada* [as suggested by the illustration given by Silberfeld (1909)], but the spines on the pinnules may be slightly smaller (0.1 mm vs. 0.1–0.14 mm in *A. antrocrada*). The polyps in *A. lata* appear to be more crowded; Silberfeld (1909) reported a polyp density of 12 per centimetre, whereas the polyp density is, on average, 9–11 per centimetre in *A. antrocrada*. Polyps were not present in the type specimen of *A. bifaria* described by Brook (1889).

Etymology

The specific name is derived from the Latin '*antrorsus*' (directed forward and upward) and '*crada*' (twig), in reference to the curving of the pinnulated branchlets.

Material Examined

Australia, Great Australian Bight, approx. 100 nautical miles (185.2 km) SSW of Eucla, 33°16'S, 128°09'E, 170 m, R/V *Comet*, 14 January 1989, coll: W. Zeidler and K. Gowlett-Holmes (holotype, SAM H-746; schizoholotype, USNM 99415). Great Australian Bight, approx. 100 nautical miles (185.2 km) SSW of Eucla, 33°16'S, 128°16'E, 190 m, R/V *Comet*, 14 January 1989, coll: W. Zeidler and K. Gowlett-Holmes (paratype, SAM H-745; schizoparatype, USNM 99413).

Distribution

The species is known only from waters off South Australia at depths of 170–190 m.

Genus ***Parantipathes*** Brook, 1889

***Parantipathes helicosticha* sp. nov.**
(Figs 4–6)

Diagnosis

Corallum sparsely branched and pinnulate. Pinnules simple, arranged biserially in 6–8 (rarely 9 or 10) rows, and in semi-spiral groups of 3–4 (rarely 5) pinnules each. Pinnules extending at nearly right angles to the direction of stem or branch on which they occur. Spines simple, smooth, acute, inclined distally; 0.10–0.20 mm from centre of base to apex. Spines arranged in axial rows, three or four of which are visible in lateral view; spaced 0.3–0.8 mm apart in each row; with 2–3.5 spines per millimetre. Polyps transversely elongated, 1.6–1.8 mm in diameter from proximal edge of proximal tentacles to distal edge of distal tentacles. Polyps arranged uniserially on upper side of pinnules, facing towards the distal end of the stem or branches. Interpolypar space about 0.6 mm, resulting in four polyps per centimetre.

Description of Holotype

The holotype (SAM H-903) is a nearly complete colony with basal plate and polyps intact (Fig. 4). It is about 55 cm tall and 27 cm wide and has a basal stem diameter of 3.5 x 4.5 mm. It is very laxly branched (only about 14 branches in all), with the branches spaced at varying distances, some only several millimetres apart, others several centimetres apart. The branches are long; the largest is about 33 cm and has a basal diameter of about 2 mm. At their point of origin, the branches project at nearly a right angle to the stem or lower order branch from which they arise; they are straight or irregularly curved over most of their course. Both the stem and branches have a columnar growth form due to the presence of multiple rows of simple elongate pinnules that lie perpendicular to the direction of the stem or branch from which they arise (i.e., distal angle about 90°). The rows of pinnules are arranged biserially, usually with an equal number on each side (Fig. 5). The most common condition is three or four rows on each side, but rarely there may be four on one side and up to five on the other. The pinnules are also arranged in alternating semi-spiral groups along the length of the branches, each group consisting of one member from each row. The pinnules in each semi-spiral group on one side of the axis follow a clockwise direction, those on the opposite side follow a counterclockwise pattern. The semi-spirals on both sides thus appear to follow an ascending pattern when viewed from one side of the corallum and a descending pattern when viewed from the opposite side. Each semi-spiral covers an axial distance of about 2 mm and often the most distal pinnule of one semi-spiral is at about the same level as the most basal pinnule of the next group on the same side. In some cases, the lowest or highest pinnule in each semispiral is located near the middle of the front or back of the axis. There are usually four semi-spiral groups per centimetre in each series. The pinnules are simple, 1.5–2 cm long and about 0.2 mm in diameter at their base. The pinnules are straight or curved upward slightly.

FIGURE 4. *Parantipathes helicosticha* sp. nov., holotype, SAM H-903, entire corallum, height about 55 cm.

The skeletal spines (Fig. 6) are simple (very rarely forked), smooth, conical to horn-shaped, very acute, and inclined distally, particularly on the mid to distal part of the pinnules. They are about 0.10 mm tall on the basal portion of the pinnules, 0.14–0.16 mm tall along the mid portion and up to 0.20 mm tall on the distal portion. The abpolypar spines are usually 0.02–0.04 mm smaller than the polypar spines, but they are sometimes larger. On the pinnules the spines are arranged in axial rows, 3–4 of which are visible in lateral view (excluding rows in which spines are only partially visible). The distance between adjacent spines in each row is variable (0.3–0.8 mm), but on average there are 2.0–3.5 spines per millimetre in each row. Spines are reduced in size on the stem and branches. On the stem the spines are no more than about 0.06 mm tall.

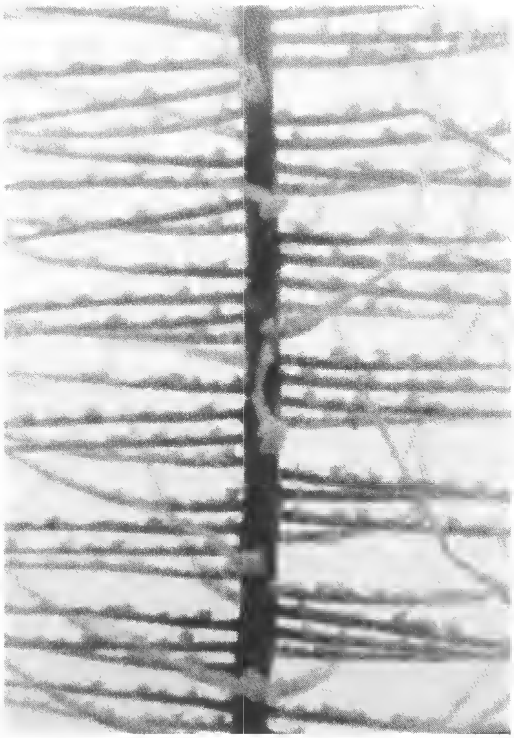

FIGURE 5. *Parantipathes helicosticha* sp. nov., holotype, SAM H-903; section of corallum showing arrangement of pinnules and polyps, approx. x 4.

The polyps (Fig. 5) on the pinnules are arranged uniserially on the upper side, facing towards the distal end of the branch on which they occur. They are mostly 1.6–1.8 mm in transverse diameter, as measured from the distal edge of the distal lateral tentacles to the proximal edge of the proximal lateral tentacles. The interpolypar space is 0.6 mm, and there are usually 4 polyps per centimetre.

Discussion

Paratypes SAM H-904 and H-901 are similar to the holotype in the growth form of the corallum, and in the size, number, and arrangement of the pinnules. The remaining paratype (SAM H-752) is more densely branched than the holotype and its pinnules are less regularly arranged, more often in semi-spiral groups of 2–3 (4 on the thicker branches), and the pinnules are spaced further apart. Each semi-spiral group takes up as much as 3 mm; therefore, there are only three groups per centimetre on each side as compared to 4 in the holotype. The spines are also slightly smaller than in the other specimens. Analysis of additional specimens may show that this specimen represents a species distinct from *P. helicosticha*.

Comparisons

Parantipathes helicosticha, sp. nov. resembles *P. larix* (Esper, 1790) and *P. tetrasticha* (Pourtalès, 1868) in the general

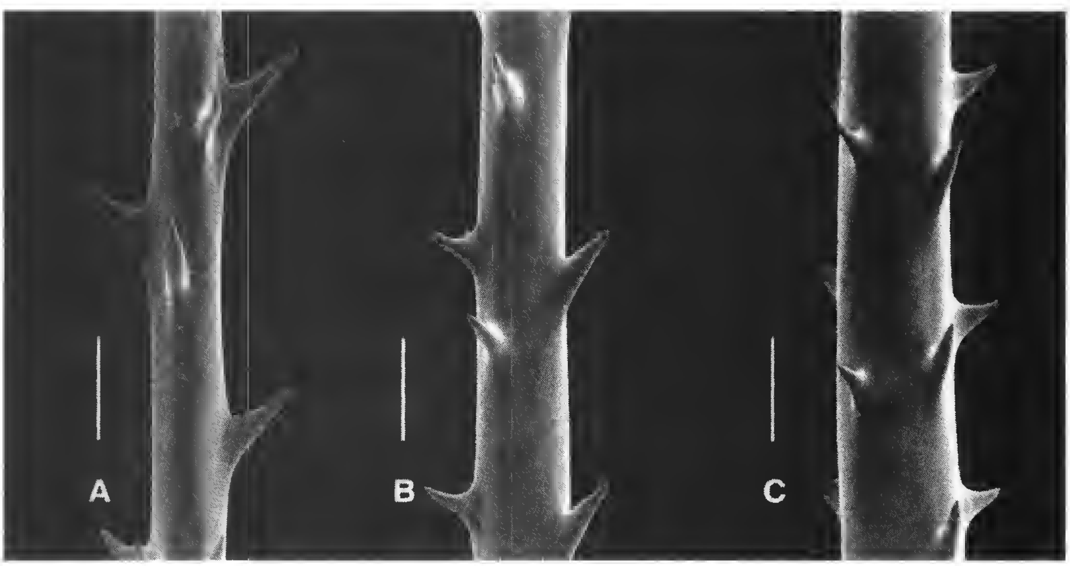

FIGURE 6. *Parantipathes helicosticha* sp. nov., scanning electron micrographs of holotype, SAM H-903. **A**, Spines near tip of pinnule 0.13 mm in diameter. **B**, spines on pinnule 0.16 mm in diameter. **C**, spines near base of pinnule 0.2 mm in diameter. Scale bars 0.2 mm.

appearance of the corallum, but differs from these species in the length or number of rows of pinnules or in the size of the spines. *P. larix* typically has only 6 rows of simple pinnules, and depending on the size of the corallum, the pinnules can be 3.5 cm to as much as 12 cm in length (Brook 1889). The spines of *P. larix* are much smaller than those in *P. helicosticha*; only 0.06–0.09 mm, as estimated from the illustration given by Brook (1889), and the polyps arc slightly longer, about 2.0 mm in transverse diameter (Brook 1889). In *P. tetrasticha*, there can be up to 8 rows of pinnules, as in *P. helicosticha*, but the pinnules are longer (up to 4 cm), the spines are shorter (0.04–0.08 mm), and the polyps are more transversely elongated (2.5 mm). Both *P. larix* and *P. tetrasticha* were originally described from the Atlantic. *Parantipathes larix* has also been reported from the Pacific (van Pesch 1914). However, van Pesch's description more closely resembles that of *P. helicosticha* than *P. larix*.

Etymology

The specific name is derived from the Latin '*helico*' (helix) and Greek '*sticha*' (twig) in reference to the arrangment of the pinnules in a quasi helical pattern.

Material Examined

Australia, approx.125 nautical miles (231 km) E of Cape Arid, W. Australia, 33°03'S, 125°31'E, 1011–1020 m, F/V Adelaide Pearl, K. Gowlett-Holmes, K. Olsson and M. Cameron, 31 July 1988, (holotype, SAM H-903; schizoholotype, USNM 99401). Approx. 125 nautical miles (231 km) S of Eucla, S. Australia, 33°45'S, 129°17'E, 999–1110 m, F/V Adelaide Pearl, K. Gowlett-Holmes, K. Olsson and M. Cameron, 1 August 1988 (paratype, SAM H-904: schizoparatype, USNM 99400). Approx. 46 nautical miles (85 km) SE of SE Cape, Tasmania, 44°14.8'S, 147°27.5'E, 1080–1130 m, F/V Belinda, K.L. Gowlett-Holmes, 9 February 1992 (paratype, SAM H-901; schizoparatype, USNM 99412). Great Australian Bight, approx. 130 nautical miles (240.8 km) SSW of Cape Adieu, 34°06'S, 131°20'E, 1124–1131 m, F/V Longa III, K. Gowlett-Holmes, 15 December 1989 (paratype, SAM H-752; schizoparatype, USNM 99414).

Distribution

The species is known only from the waters off Tasmania and South Australia at depths of 999 to 1130 m.

***Parantipathes triadocrada* sp. nov.**
(Figs 7–9)

Diagnosis

Corallum sparsely branched, but densely pinnulate. Primary pinnules arranged in three irregular axial rows, two lateral and one posterior. Lateral primary pinnules more complexly subpinnulate than posterior primary pinnules. Pinnules and subpinnules (six or more orders) also grouped together in clusters (pseudo-verticils) containing one pinnule from each row. Pinnules and subpinnules adhering. Spincs simple, conical, smooth, with acute to rounded apex; usually 0.06–0.08 mm from centre of base to apex. Spines on pinnules and subpinnules arranged in axial rows; up to 6–7 rows visible in lateral view. Spines 0.16–0.30 mm apart in each row, with 5–6 spines per millimetre, on average. Polyps not more than 1.2 mm in transverse diameter from proximal side of proximal lateral tentacles to distal side of distal lateral tentacles. Polyps arranged uniserially on upper or anterolateral sides of pinnules and subpinnules; with 7–8 polyps per centimetre.

Description of Holotype

The holotype (SAM H-908; Fig. 7) is about 22 cm tall and 12 cm wide and has at its basal end a reticulated skeletal structure formed by the irregular cross-linking of adjacent branches by thick branchlets. This part of the colony has a stem-like branch about 2 mm in diameter. Several branches 10–20 cm in length originate along this 'stem' and extend vertically, one becoming fused apically with pinnules of the stem. Both the stem and major branches have a columnar growth form due to the presence of pinnules along their length. Although the pinnules can occur singly and in pairs, the most common arrangement is in three irregular vertical rows and also in clusters each containing three (very rarely four) members. Two of the vertical rows are bilateral and the third is on the posterior side of the axis. The pinnules in the two lateral rows are usually much more higher developed (complexly subpinnulate) than those in the posterior row (Fig. 8A); consequently, the stem and individual branches have a somewhat bilateral structure. The clusters of pinnules consist of one member of each row arising from nearly the same location on the axis; however, the members of a group rarely arise at exactly the same point. Instead, they are separated by intervals of 0.1–0.3 mm (Fig. 8B). Therefore, the clusters might best bc referred to as pseudo-verticils. The arrangement of the pinnules within each pseudo-

FIGURE 7. *Parantipathes triadocrada* sp. nov., holotype, SAM H-908, height about 22 cm.

verticil is irregular; a spiral or helical pattern not being apparent. The pseudo-verticils are spaced, on average, about 3 mm apart, but the distance can range from 2.5 to 4.5 mm. On some parts of the corallum the pseudo-verticils are incomplete due to the absence of one or even two members, and consequently, the pinnules and subpinnules are spaced irregularly along the axis.

The lateral primary pinnules on the stem and branches have as many as six orders of subpinnnules; in contrast, the posterior primary pinnules have relatively few subpinnules (Fig. 8A). The subpinnules develop in the same manner as the primary pinnules, usually in pseudo-verticils of three, spaced about 3 mm apart. Any one or more of the subpinnules can, in turn, have similar subpinnules, and this pattern can be repeated over several higher orders of

FIGURE 8. *Parantipathes triadocrada* sp. nov., holotype, SAM H-908. **A**, cross section of branch showing arrangement of pinnules, approx. x 1.7. **B**, lateral view of clusters of pinnules, approx. x 3.5. **C**, pinnules with polyps, approx. x 5.

subpinnules. Although many exceptions occur, pinnules less than 1 cm long are likely to have only one order of subpinnules (and sometimes only one or a bilateral pair, rather than three); those about 2 cm long often have 1 or 2 orders of subpinnules; those 3 cm long have four or five; and those 4 cm long have as many as 6 orders. The subpinnules do not develop to the same extent from pinnule to pinnule; therefore the pattern of subpinnulation is not symmetrical. The largest unpinnulated pinnules or subpinnules are rarely more than about 7 mm in length and have a basal diameter of 0.14–0.16 mm (excluding spines). The pinnules and subpinnules arise from the lower order ramifications at nearly a right angle, but in most cases they curve upward towards the distal end of the stem or branch on which they occur. Overall, the apparent distal angle is 45–60°. Fusions of overlapping pinnules and subpinnules occur frequently and as a result, the lateral sides of the stem and branches (and also the anterior side in some places) form a dense mass of anastomosing subpinnules. Subpinnules of some adjacent branches are also fused together.

The skeletal spines (Fig. 9) are simple, smooth, and conical with an acute to rounded apex. They are mostly subequal in size around the circumference of the axis, although in places they can be slightly larger to twice as tall on one side. Spines on the pinnules and subpinnules are usually 0.06–0.08 mm tall from the midpoint of the base to the apex; a few near the base of the larger pinnules (diameter 0.14–0.16 mm) reach a size of 0.10–0.12 mm. The majority of spines project at right angles to the axis; some are inclined distally, particularly those near the distal end of the pinnule. The spines are arranged in axial rows with 3–4 rows visible in lateral view (including only rows in which the base of the spines can be seen). However, on some pinnules, and primarily near the base of the pinnules, as many as 6–7 rows are visible. The distance between adjacent spines in each row varies from about 0.16 to 0.30 mm; on average there are 5–6 spines per millimetre in each row. Although the distribution and spacing of the spines is quite regular on many pinnules and subpinnules, the pattern becomes less regular near the base of the pinnules, with new spines developing between the rows. There are only a few scattered spines on the larger branches at the base of the corallum, some of these are relatively narrow and acicular, but few are more than 0.06 mm tall.

The polyps (Fig. 8C) on the subpinnules and pinnules are distributed uniserially on the upper or anterolateral sides of axis, thereby facing toward the distal end of the branch on which the pinnules occur. Because the pinnulation is more strongly developed on one side of the axis, there is a distinct polypar and abpolyar side of the

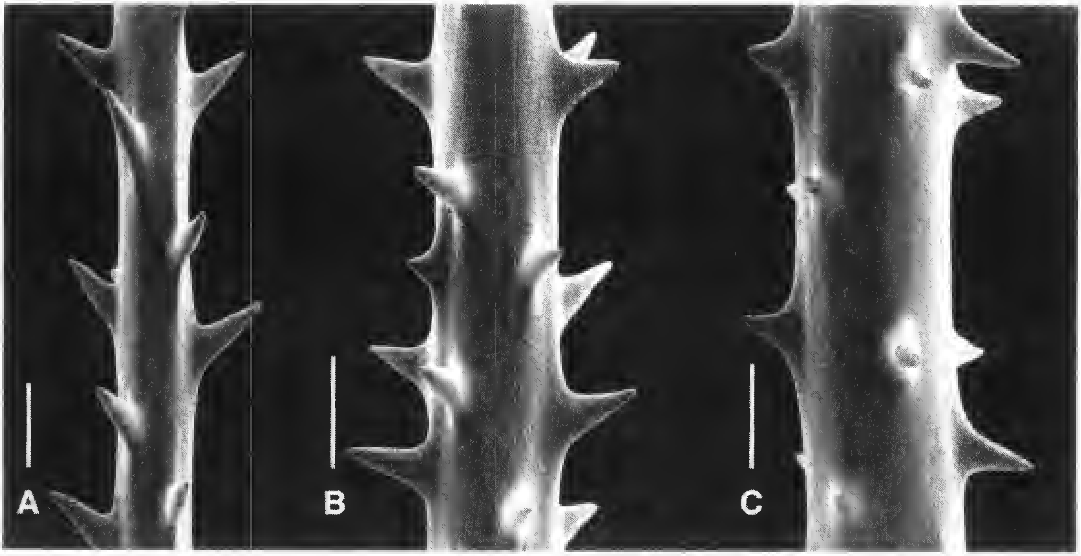

FIGURE 9. *Parantipathes triadocrada* sp. nov., scanning electron micrographs of holotype, SAM H-908. **A**, Spines near distal end of pinnule 0.08 mm in diameter. **B**, spines on middle of pinnule 0.1 mm in diameter. **C**, spines on pinnule 0.15 mm in diameter. Scale bars 0.1 mm.

corallum when viewed from above (Fig. 8A). The polyps are 0.8–1.1 mm in transverse diameter, as measured from the distal side of the base of the distal lateral tentacles to the proximal side of the base of the proximal lateral tentacles, and the interpolypar space is 0.3–0.4 mm. Seven to 8 polyps occur along one centimetre of axis. The mouth is often slit-shaped and elongated along the sagittal axis, and the tentacles are up to 0.3 mm long (in the alcohol-preserved material). Some polyps appear very elongated along the transverse axis such that transverse diameter is about three times longer than the sagittal diameter (e.g., 0.8 mm vs. 0.25 mm).

Discussion

A second specimen collected at the same station as the holotype is about 25 cm tall and 6 cm wide (SAM H-986). At its basal end (as well as at several points higher up on the corallum) it has a reticulated skeletal structure similar to that seen in the holotype. This colony and the other two paratypes exhibit the same general growth form as the holotype, with the major branches directed vertically and with numerous anastomosing pinnules and subpinnules. Young colonies are likely to have a simple corallum with few if any branches. In one of the two paratypes (which is broken in three pieces) a well-defined stem is present which, just above the holdfast, is 4.5 x 5.5 mm in diameter. As in the holotype, the axis of the stem and major branches is compressed laterally (oblong in cross section) such that the widest diameter is at right angles to the plane formed by the lateral pinnules.

Comparisons

This species resembles *Parantipathes columnaris* (Duchassaing, 1870) in having the pinnules and subpinnules arranged in pseudo-verticils. However, in *P. columnaris* the corallum is usually monopodial, always has reticulated worm run along the stem, has fewer orders of subpinnules, and usually more than three subpinnules in each pseudo-verticil.

Several species currently placed in the genus *Parantipathes*, including *P. columnaris* (Duchassaing, 1870), *P. tenuispina* Silberfeld, 1909, and *P. cylindrica* Brook, 1889, differ from the type species *P. larix* (Esper, 1790) in having polyps that are not much more then 1.0 mm in transverse diameter. These species also form a natural assemblage united by the tendency of parts of the corallum to anastomose. These species may also have affinities to several flabellate species (i.e., *Tylopathes crispa* Brook, 1889 and *Antipathella contorta* Brook, 1889) which have similar sized polyps and anastomosing branches and branchlets. Further study may show that these species merit separate taxonomic recognition.

Etymology

The specific name is derived from the Latin '*triado*' (in groups of three) and '*crada*' (twig) in reference to the arrangement of the pinnules and subpinnules into pseudo-verticillate clusters of three.

Material Examined

Off Tasmania, approx. 46.5 nautical miles (86 km) SSE of South East Cape, 44°22.7'S, 147°07.3'E, 1060–1170 m, F/V *Belinda*, 12 February 1992, coll: K. Gowlett-Holmes (holotype, SAM H-908; schizoholotype, USNM 99410; paratype, SAM H-986). South Australia, Great Australian Bight, approx. 80 nautical miles (148 km) WSW of Pearson Id, in Investigator Group, 34°11'S, 132°38'E, 160 m, F/V *Comet*, 14 April 1979, coll: K. Gowlett-Holmes (paratype, SAM H-759). South Australia, Great Australian Bight, approx. 90 nautical miles (167 km) W of Cape Wiles, 38°04'S, 133°59'E, 625–890 m, F/V *Longa III*, 9 November 1989, coll: K. Gowlett-Holmes (paratype, SAM H-760).

Distribution

The species is currently known only from the waters off Tasmania and South Australia at depths of 160 to 1170 m.

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